DESCRIPTIVE MODEL OF LATERITIC Ni

By Donald A. Singer

DESCRIPTION Nickel-rich, in situ lateritic weathering products developed from dunites and peridotites. Ni-rich iron oxides are most common. Some deposits are predominantly Ni silicates.

GENERAL REFERENCE Evans and others (1979).

GEOLOGICAL ENVIRONMENT

Rock Types Ultramafic rocks, particularity peridotite, dunite, and serpentinized peridotite.

Age Range Precambrian to Tertiary source rocks, typically Cenozoic weathering.

Depositional Environment Relatively high rates of chemical weathering (warm-humid climates) and relatively low rates of physical erosion.

Tectonic Setting(s) Convergent margins where ophiolite have been emplaced. Uplift is required to expose ultramafic to weathering.

Associated Deposit Types Podiform chromite, PGE placers, serpentine-hosted asbestos.

DEPOSIT DESCRIPTION

Mineralogy Garnierite, poorly defined hydrous silicates, quartz, and goethite. Goethite commonly contains much Ni.

Texture/Structure Red-brown pisolitic soils, silica-rich boxworks.

Alteration Zoned--from top: (1) Red, yellow, and brown limonitic soils; (2) saprolites--continuous transition from soft saprolite below limonite zone, hard saprolite and saprolitized peridotite, to fresh peridotite. Boxwork of chalcedony and garnierite occurs near bedrock-weathered rock.

Ore Controls Upper limonite zone containing 0.5-2 percent Ni in iron-oxides; lower saprolite and boxwork zone typically contains 2-4 percent Ni in hydrous silicates. The oxide and silicate ores are end members and most mineralization contains some of both.

Weathering The profile from red-brown pisolitic soil down to saprolite represents the products of chemically weathered ultramafic rocks.

Geochemical Signature Enriched in Ni, Co, Cr; depleted in MgO relative to fresh peridotite (less than 40 percent MgO).

EXAMPLES

Poro, NCAL	(Troly and others, 1979)
Cerro Matoso, CLBA	(Gomez and others, 1979)
Nickel Mountain, USOR	(Chace and others, 1969)
Greenvale, AUQL	(Burger, 1979)

GRADE AND TONNAGE MODEL OF LATERITIC Ni

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COMMENTS Higher grades are typically associated with the silicate type. Numerous low-grade (less than 1 percent Ni) and low-tonnage deposits are not included. Nickel grade is correlated with tonnage ($r = -0.31$). See figs. 189, 190.

DEPOSITS

Name	Country	Name	Country
Ambatory	MDGS	Moa Bay	CUBA
Analumay	MDGS	Moorsom	PLPN
Barro Alto	BRZL	Moramanga	MDGS
Berong	PLPN	Morro de Engenho	BRZL
Bhimatangar	INDA	Mwaytung	BRMA
Blue Ridge	PLPN	Nepoui	NCAL
Br. Solomon 1s.	SLMN	New Frontier	PLPN
Buka	PLPN	Niquelandia	BRZL
Cabo Rojo	PTRC	Nonoc	PLPN
Cerro Matoso	CLBA	Obi	INDS
Claude Hills	AUSA	Ora Banda	AUWA
Cyclops	INDS	Orsk	URRS
Dinagat Is.	PLPN	Pujada Pen.	PLPN
Euboea	GREC	Pomalea	INDS
Exmibal	GUAT	Poro	NCAL
Falconbridge	DMRP	Poum	NCAL
Gag Is.	INDS	Pratapoli.s	BRZL
Golesh Mt.	YUGO	Prony	NCAL
Golos	YUGO	Ramona-Loma	CUBA
Goro	NCAL	Riddle	USOR
Greenvale	AUQL	Rio Tuba	PLPN
Hagios Ioannis	GREC	Sablayon	PLPN
Halmahera	INDS	Sao Joaodo Piaui	BRZL
Ipaneme	BRZL	Santa Cruz	PLPN
Jacupuenga	BRZL	Saruabi	INDA
Kaliapani	INDA	S.E. Kalimantan	INDS
Kansa	INDA	Sidamo	ETHP
Kauadarci	YUGO	Simlipal	INDA
Laguney	PLPN	Soroako	INDS
Lake Joanina	GREC	Sukinda	INDA
Leviso R.	CUBA	Suriagao	PLPN
Loma de Hierro	VNZL	Taco Bay	CUBA
Long Point	PLPN	Thio	NCAL
Marlborough	AUQL	Tiebaghi	NCAL
Masinloc	PLPN	Wingelinna-Daisy	AUWA
Mayari	CUBA		

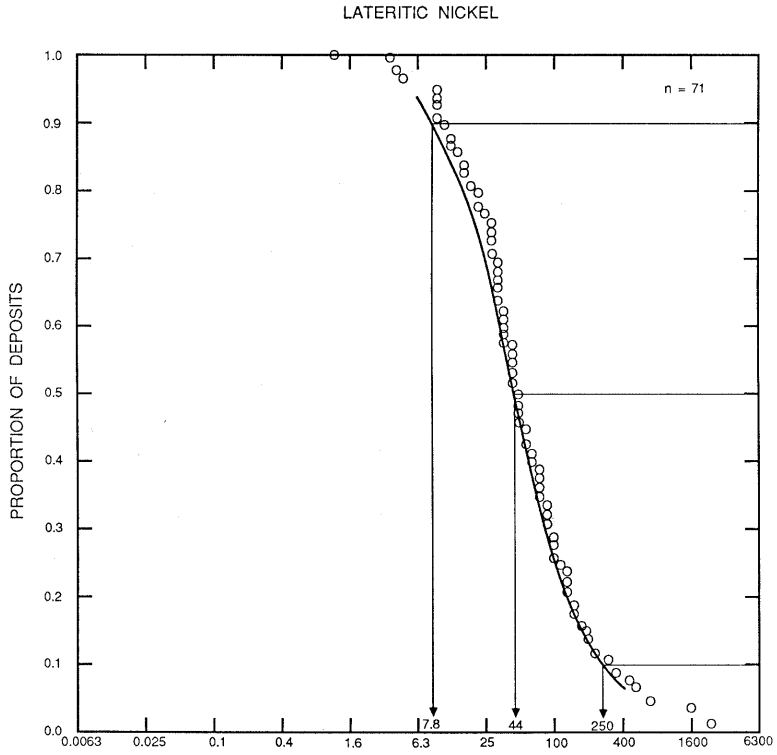

Figure 189. Tonnages of lateritic Ni deposits.

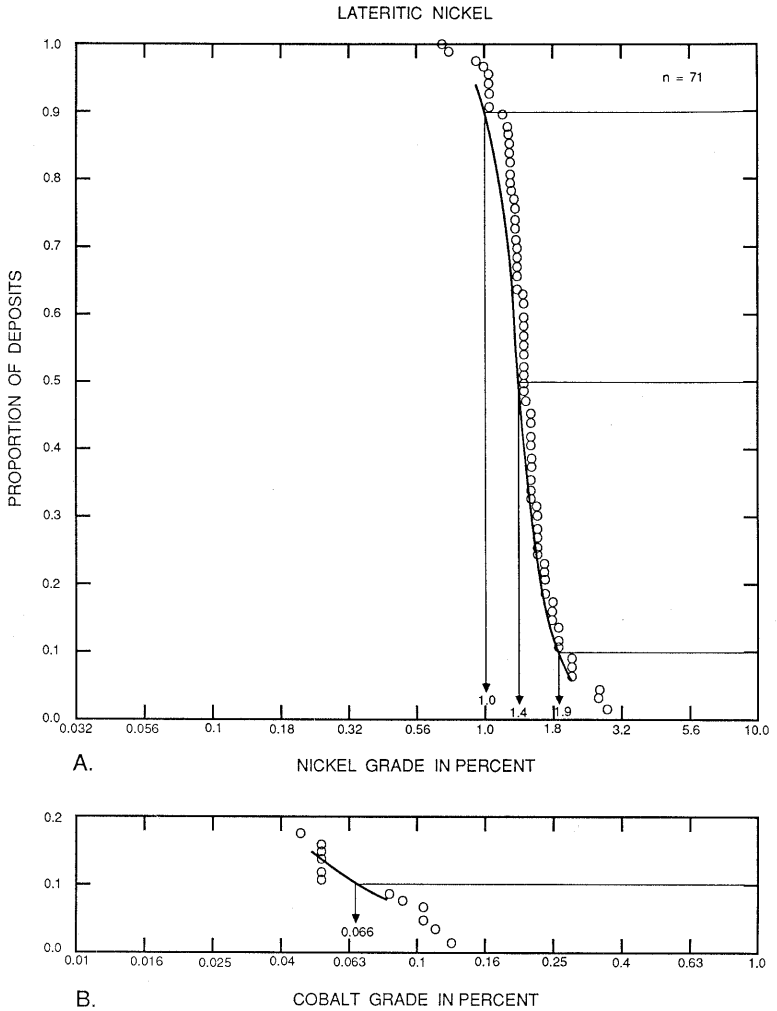

Figure 190. Metal grades of lateritic Ni deposits. A, Nickel. B, Cobalt.